EWF – Emergency Warning Functionality for Digital Radio DRM and DAB(+)

A Core Element of any National Disaster Warning Dissemination Approach

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EWF for Digital Radio
The Task

In case of pending or current
disasters / catastrophes,
inform the **public** (+authorities)
with **maximum reach**
as **quickly** as possible,
giving **all relevant information**.

→ How can Digital Radio
help to fulfil this requirement?

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Stages of a Disaster Operation

Detection of pending disaster

Disaster hits

Digital Radio provides essential services in all these stages, as it:

a) **reaches the affected people reliably**

b) enables detailed **multi-lingual text infos**

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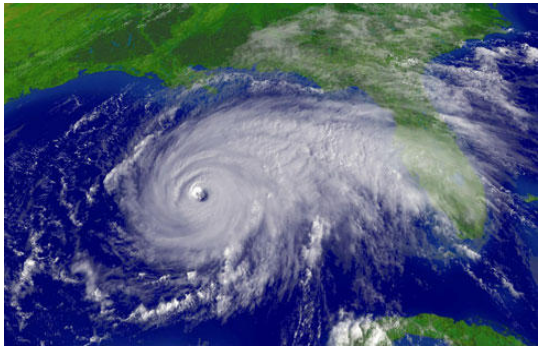
Tools for Information Dissemination



- What is the country's approach today on information dissemination in case of disasters?
  - Analog AM/FM Radio
  - Mobile phones, SMS
  - Internet / Social Media
  - TV (satellite, terrestrial)
  - Special Devices, Alarm Systems

→ All important; plus
Digital Radio as the corner stone

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Unique Benefits for Information Dissemination

- Radio is **ubiquitously available**:
  - at home
  - at work
  - in the car
  - as portables & in mobile phones
  - outdoors & indoors
- Radio is a companion with an **everyday purpose**
  → unintrusive and always present

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Unique Benefits for Information Dissemination

- Radio is **independent from local infrastructure**:
  - Battery powered / wind-up
  - No satellite dishes / settop boxes
  - Large-area transmitter coverage from outside disaster area (DRM on AM frequencies)
  - Secured transmitter sites (backup power etc.)
  - Well-controlled infrastructure

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Unique Benefits for Information Dissemination

- **Open Digital Radio Standards** have EWF – Emergency Warning Functionality – as **default feature**:
  - Alarm signalling sent to receivers
  - Automatic station re-tuning + Automatic receiver switch-on (opt.)
  - Visual signalling + volume increase
  - Emergency program with **audio + multilingual text**

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Relevant standardized data applications

DAB Dynamic Label / DRM TextMessage

scrolling text sequence

```
Tsunami pending in
Shanghai at 16:00
```

- Max. 128 characters, typ. every 20 sec.
- Automatic sequence: no user-interaction

Journaline

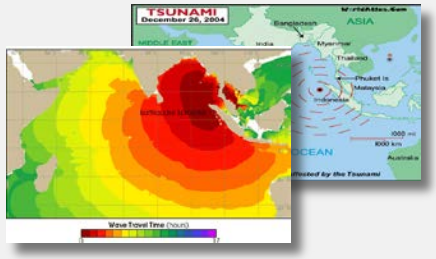
advanced on-demand text

NewsService Journaline®

- Full news articles with topic structure (menus)
- On-demand look-up
- Multilingual (Unicode)

Slideshow

image sequence



- Images, typ. 320x240
- Automatic sequence: no user-interaction (optional categories)

All Receiver Classes
(text-only screen)

Multimedia Rx
(colour graphics screen)

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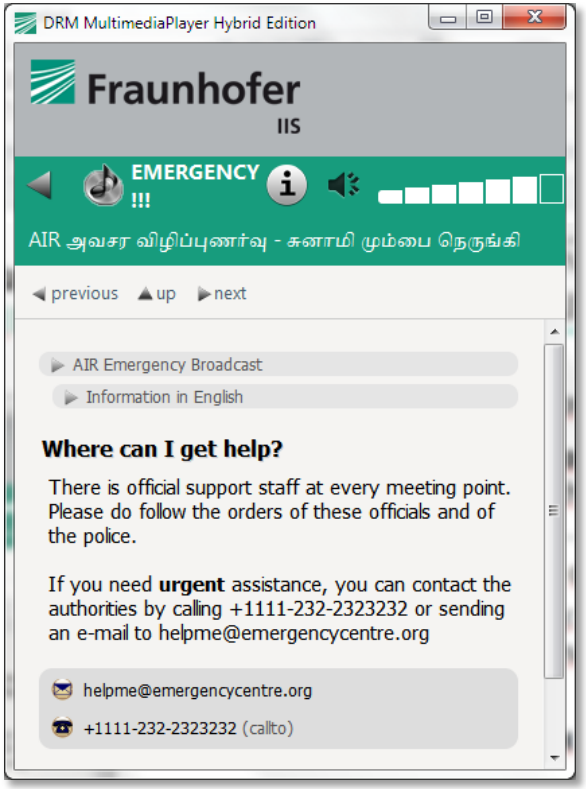
Standardized Data Applications

NewsService Journaline®



The advanced text application enables

- **Multilingual instructions**:
  What happened? / Which area? /
  What do I need to do? …
- Integrated **images** (SLS or online)
- **Hot-Button** interactivity:
  links to phone, web, e-mail, SMS
- **Geo-referencing**
- Small foot-print → **all rx classes**

→ Serves **non-native speakers** and the **hearing impaired** with **full instructions instantly**

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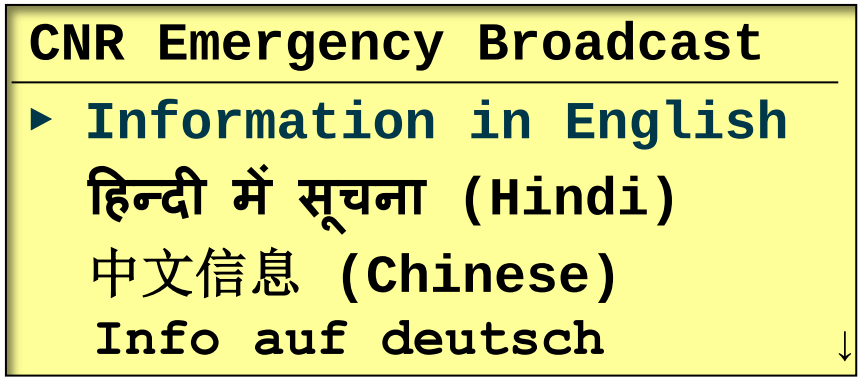
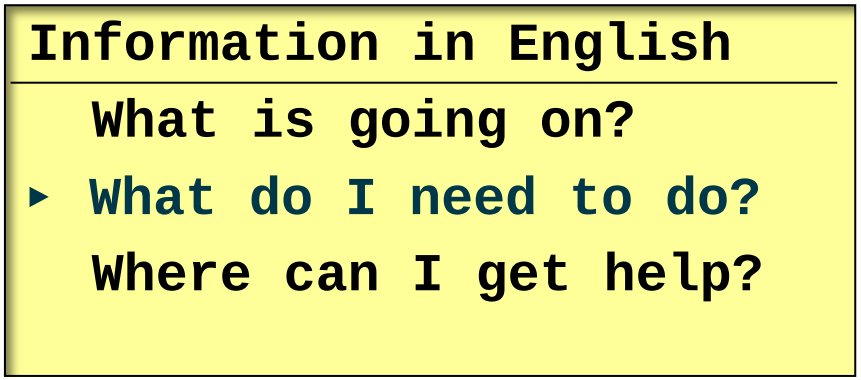
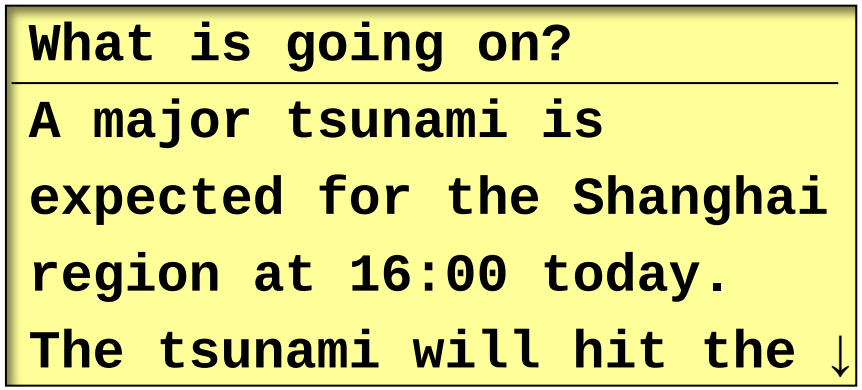
Standardized Data Applications

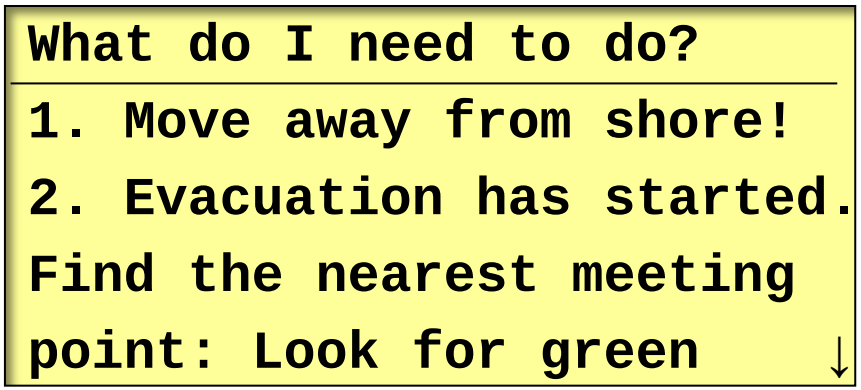
NewsService Journaline®

Examples for receiver screen renderings,
showing emergency text content (Journaline):









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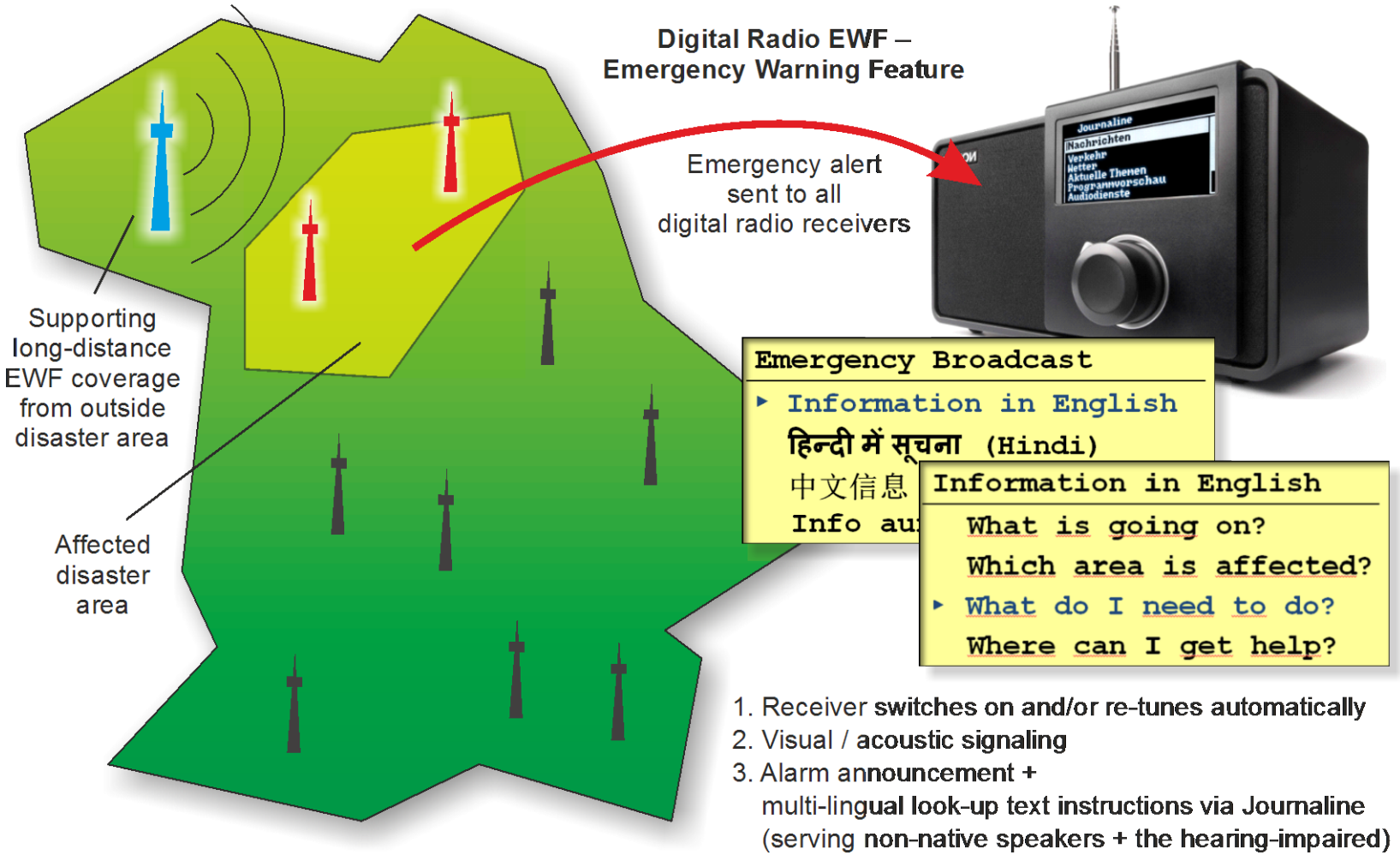
Functional Overview



1. Receiver switches on and/or re-tunes automatically
2. Visual / acoustic signaling
3. Alarm announcement +
   multi-lingual look-up text instructions via Journaline
   (serving non-native speakers + the hearing-impaired)

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Listener Experience

When the **alarm signal is triggered** by authorities:

- All running Digital receivers pick up alarm signal from currently received service, and switch to emergency broadcast (if required)
- Turned-off receivers may switch on automatically (requirement to be communicated to rx mfcts)

→ Receivers present the **audio content** of the emergency programme

→ Receivers with text screen in addition present

- **detailed information and instructions** (Journaline)
- **text-headlines** (TextMessg. / Dyn.Labels)

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EWF for Digital Radio – Receiver Demo (Test Firmware)

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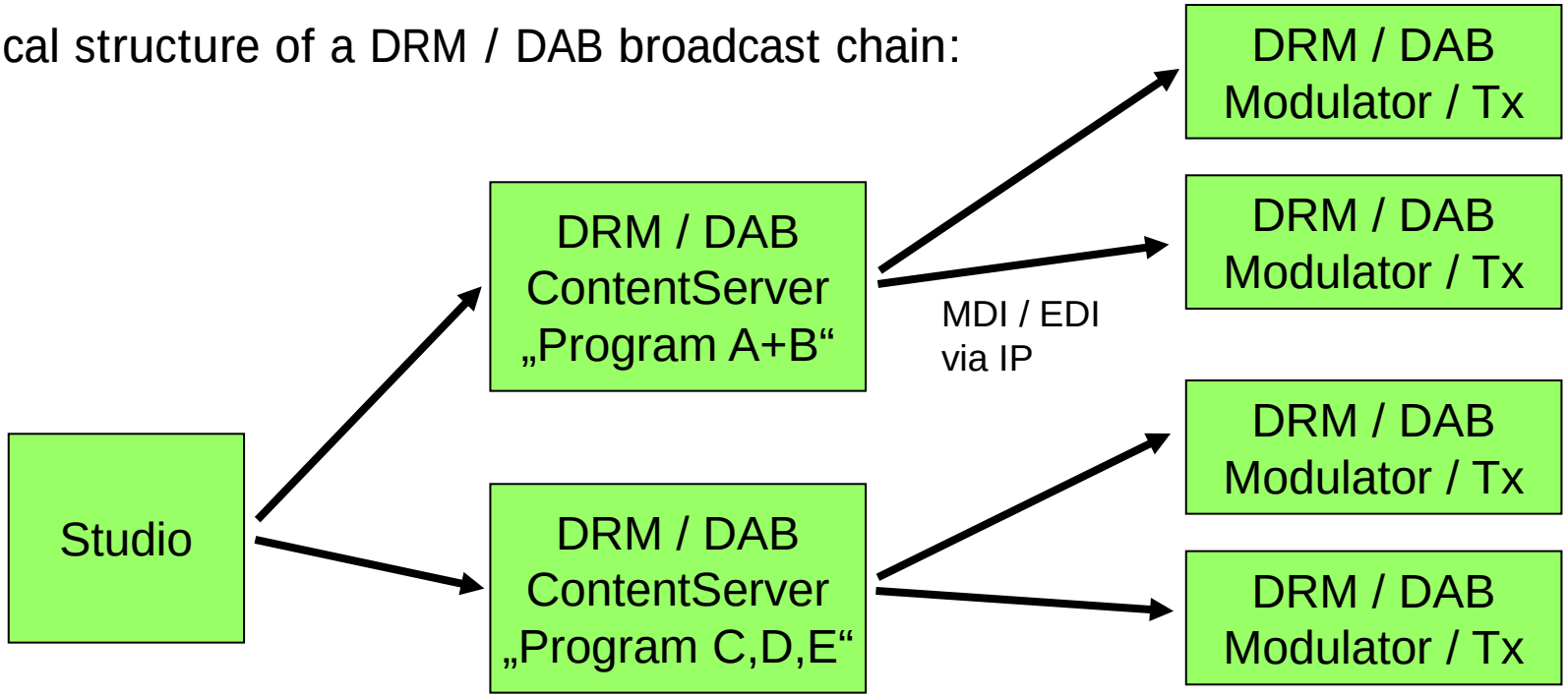
Transmission Infrastructure

Typical structure of a DRM / DAB broadcast chain:



- Generates audio + text
- Defines service configuration

- Creates Digital Radio multiplex signal
- One per region or program-set

- Broadcast Digital Radio signal on-air

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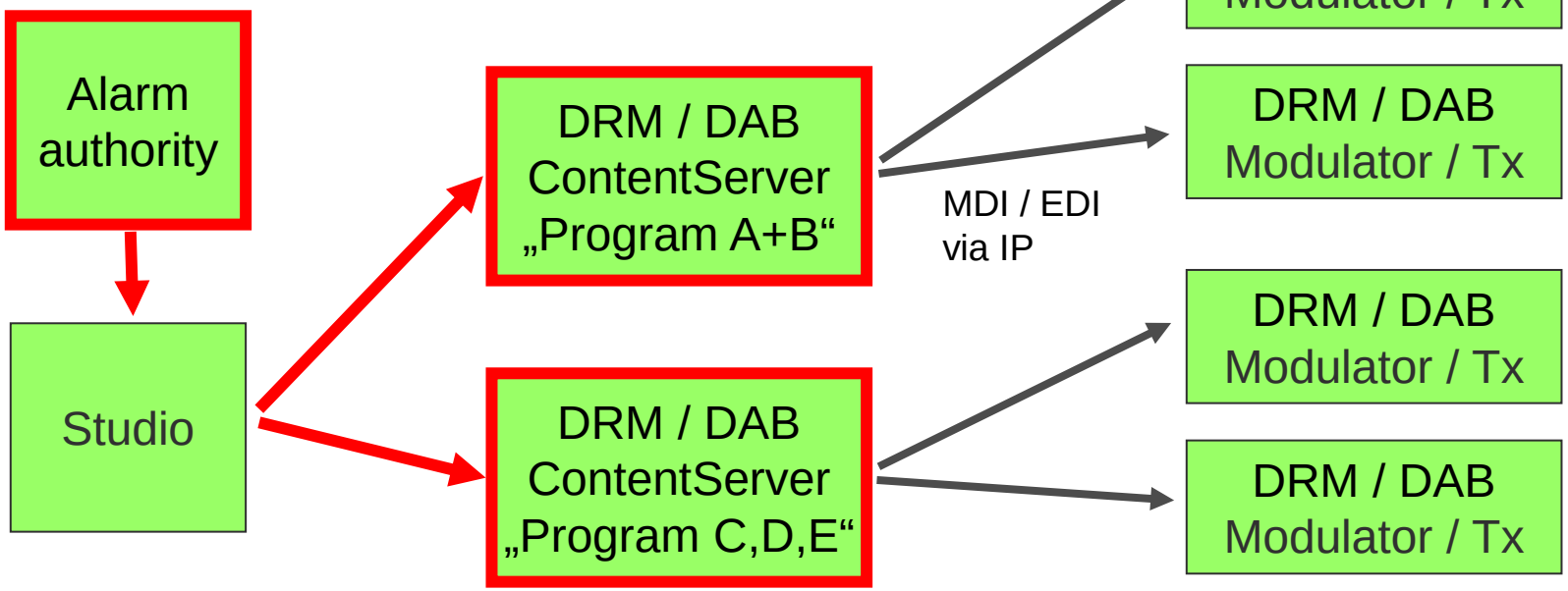
Transmission Infrastructure

When emergency alarm is triggered:



- **Central authority** triggers alarm for ALL relevant radio stations
- **ContentServers** insert Alarm signal
- Optional dynamic Service-Reconfiguration (making room for 1 emergency program)

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Preparatory Considerations

Considerations for the Broadcast Chain:

1. Prepare in advance:

→ Enable **alarm** signalling for all Digital Radio services (+ **configs** with emergency programs)

→ Establish alarm trigger **signal paths** from central authorities to all stations

→ Prepare textual information **content** + access to emergency audio program

2. In case of emergency alert:

→ **Send alarm** to all Digital Radio receivers

→ Broadcast **emergency program** with audio + text (with maximum coverage)

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EWF-Ready Devices

NOXON
SWITCH ON. HAVE FUN.

- PC USB dongle for DAB reception
- First device providing rich support for advanced DAB+ features:
  - **Full EWF functionality**
  - Announcements / alarm
  - Journaline
  - MPEG Surround
  - DL+, Intellitext, SLS, BWS, …
- Radio Software continuously enhanced

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EWF-Ready Devices

- Noxon Journaline DAB Radio
- First DAB receiver with **full EWF functionality** through firmware upgrade
- Based on Quantek chipsets: First DAB chipset with **full EWF support**

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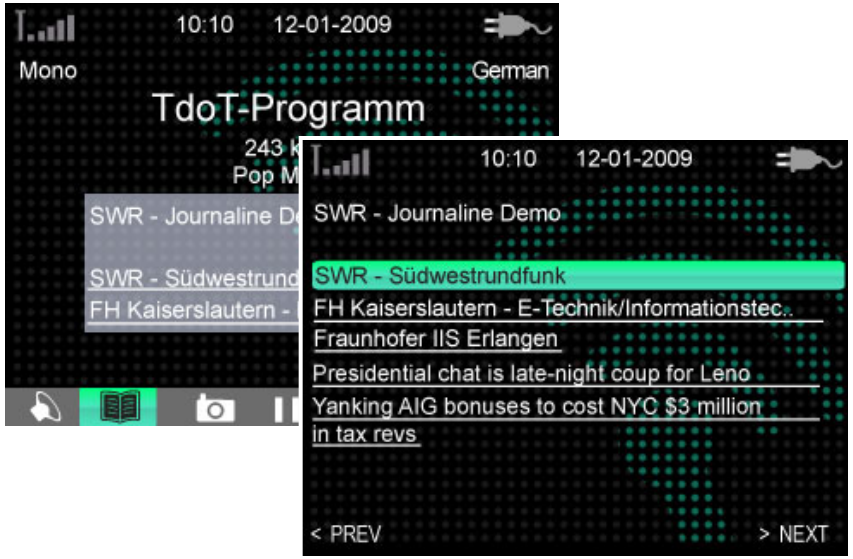
EWF-Ready Devices

UniWave Development

UniWave Di-Wave 100

Graphic by www.universal-radio.com/catalog/portable/0023.html

- Uniwave Di-Wave 100: DRM multimedia receiver
- **Full EWF support** through complimentary firmware upgrade



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EWF-Ready Devices

NEWSTAR ELECTRONICS 纽斯达电子

- NewStar DR111: Lower-end DRM Receiver from China
- **Full EWF support** with free firmware upgrade
- Access to all Journaline information even on a 2x16 text screen!

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EWF-Ready Devices

- Avion AV DR1401
  First DRM mass-market receiver announced, developed and manufactured in India
- Full DRM feature set,
  incl. Journaline &
  EWF support

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Conclusion

The Digital Radio standards DRM & DAB have all required tools built-in for a quick and complete mass-notification in case of disasters / catastrophes.

Preparation is required!

- Alarm trigger routing
- Content (audio + text)

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Recommendation

1. **Digital Radio DRM / DAB** should be a **major building-block** for any national / regional Emergency Warning solution.

2. In addition to local service coverage (DAB / DRM+), national **remote coverage** (DRM30) should always be available.

3. Full **EWF support + auto-wake-up** in Digital Radio Receivers should be a **national policy** for manufacturers.

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Thank you!

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